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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,102	04/28/2006	Sascha Sadewasser	050715-US	2500

30234 7590 04/10/2007  
LAW OFFICES OF KARL HORMANN  
86 SPARKS STREET  
CAMBRIDGE, MA 02138

EXAMINER
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PATEL, REEMA

ART UNIT	PAPER NUMBER
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2812

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/10/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/553,102	SADEWASSER ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Reema Patel	2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 15 October 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 11-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gallagher (U.S. 5, 294,465) in view of Scheer et al. (U.S. 2004/0115938 A1).

4. Regarding claim 11, Gallagher discloses the following claimed elements:

- A method of fabricating a nano-scaled semiconductor, comprising the steps of;
  - providing a substrate and aligning a movable tip of the probe of a scanning electron microscope relative to the substrate (col 4, lines 53-54);
  - utilizing a temperature and pressure controlled atmosphere of a mixture of a plurality of precursor gases (col 4, lines 58-61);
  - providing, as a function of voltage and time, a spatially limited electric field between the tip and the substrate to break down the precursor compound to precipitate onto the substrate (col 4, lines 56-57);

5. Yet, Gallagher does not disclose that the compounds of the precursor gases combine chemically and precipitate onto a substrate. However, Scheer et al. discloses

using a precursor containing a mixture of different compounds where the different compounds combine chemically so as to form a new compound semiconductor material ([0019]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Gallagher with using a mixture of precursor gases that combine chemically so as to precipitate a new compound semiconductor material onto a surface.

6. Regarding claim 12, Scheer et al. discloses that the precursor gases are utilized simultaneously ([0019]).

7. Regarding claim 13, Scheer et al. discloses that the precursor gases are utilized sequentially ([0019]).

8. Regarding claim 14, Scheer et al. discloses that the material components are selected from the group consisting of at least one element of chemical groups V and VI and of at least one element of chemical groups I, II, III, and IV ([0010]).

9. Regarding claim 15, Gallagher in view of Scheer et al. does not disclose that the element of chemical groups V and VI is tellurium and the element from groups I, II, III, IV is cadmium. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use tellurium as the element of groups V and VI and cadmium as the element from groups I, II, III, IV, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

10. Regarding claim 16, Scheer et al. discloses that the compound semiconductor comprises a chalco-pyrite from the material system of (Cu, Ag) (Ga, In, Al) (O, S, Se)<sub>2</sub> ([0010]).

11. Regarding claim 17, Scheer et al. discloses that at least one of the precursor gases and the mixing ratio thereof in the gas mixture is chronologically varied during precipitation ([0019]).

12. Regarding claim 18, Gallagher discloses the use of a computer to determine and control parameter variations (col 16, lines 15-22).

13. Regarding claim 20, Gallagher discloses incrementally moving the tip (col 5, lines 27-30).

14. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gallagher (U.S. 5, 294,465) in view of Scheer et al. (U.S. 2004/0115938 A1) as applied to claim 11 above, and further in view of Krijn et al. (U.S. 6,281,525 B1).

15. Regarding claim 19, Gallagher in view of Scheer et al. does not disclose the use of a flexible substrate. However, Krijn et al. discloses the use of a flexible substrate (col 3, lines 45-46) is preferable since it cracks less easily and is therefore easier to process. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Gallagher in view of Scheer et al. with using a flexible substrate, as taught by Krijn et al., for easier processing.

16. Claims 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gallagher (U.S. 5, 294,465) in view of Scheer et al. (U.S. 2004/0115938 A1) as applied to claim 11 above, and further in view of Fujita et al. (U.S. 6,157,047).

17. Regarding claim 21, Gallagher in view of Scheer et al. does not disclose that the precipitated chemical compounds vary in spectral sensitivity. However, Fujita et al. discloses an application of using nanocrystals composed of compound semiconductor materials in making light emitting semiconductor devices. In such an application, the nanocrystals vary in spectral sensitivity (col 11, lines 22-26).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Gallagher in view of Scheer et al. with creating nanostructures that vary in spectral sensitivity so as to produce a light emitting device.

18. Regarding claim 22, Fujita et al. discloses that the spectral sensitivity of the chemical compound varies between the primary colors of red, green, and blue (col 11, lines 22-26).

19. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gallagher (U.S. 5, 294,465) in view of Scheer et al. (U.S. 2004/0115938 A1) as applied to claim 20 above, and further in view of Binnig et al. (U.S. 4,539,089).

20. Regarding claim 23, Gallagher in view of Scheer et al. discloses the step of incrementally moving the tip but does not disclose precipitating the chemical compound in synchronism with the movement of the tip. However, Binnig et al. discloses

precipitating while simultaneously moving a tip for the purpose of forming a fine line (col 2, lines 38-41). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to precipitate the chemical compound in synchronism with the movement of the tip so as to be able to form a fine line nanostructure.

21. Claims 24-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gallagher (U.S. 5, 294,465) in view of Scheer et al. (U.S. 2004/0115938 A1) and in further view of Binnig et al. (U.S. 4,539,089) as applied to claim 23 above, and further in view of Fujita et al. (U.S. 6,157,047).

22. Regarding claim 24, Gallagher in view of Scheer et al. in further view of Binnig et al. does not disclose placing a semiconductor cover layer between individual common chemical compounds. However, Fujita et al. discloses an application of using nanocrystals composed of compound semiconductor materials in making light emitting semiconductor devices. In such an application, there is a semiconductor cover layer between individual common compounds (col 11, lines 23-26). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have a semiconductor cover layer between individual common compounds as to be able to isolate the individual common compounds in a light emitting semiconductor device.

23. Regarding claim 25, Fujita et al. discloses that the cover is an insulating layer (col 11, lines 25-26).

24. Regarding claim 26, Fujita et al. discloses that the insulating layer is of a charge conductivity opposite that of the individual common chemical compounds (col 6, lines 35-47).

25. Regarding claim 27, Fujita et al. discloses a semiconductor element comprising an array of a plurality of precipitated micro-dots forming at least one of a plurality of photo diodes and light emitting diodes (col 11, lines 12-14).

26. Regarding claim 28, Fujita et al. discloses that the array comprises a regularly repeating pattern of at least one of the plurality of photo diodes and light emitting diodes (col 11, lines 12-14).

27. Regarding claim 29, Fujita et al. discloses a semiconductor cover layer of a charge conductivity opposite that of the photo diodes and light emitting diodes is provided between individual photodiodes and light emitting diodes (col 6, lines 35-47).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Reema Patel whose telephone number is 571-270-1436. The examiner can normally be reached on M-F, 8:00-4:30 EST.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on 571-272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SCOTT B. GEYER  
PRIMARY EXAMINER

RSP  
4/2/07

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